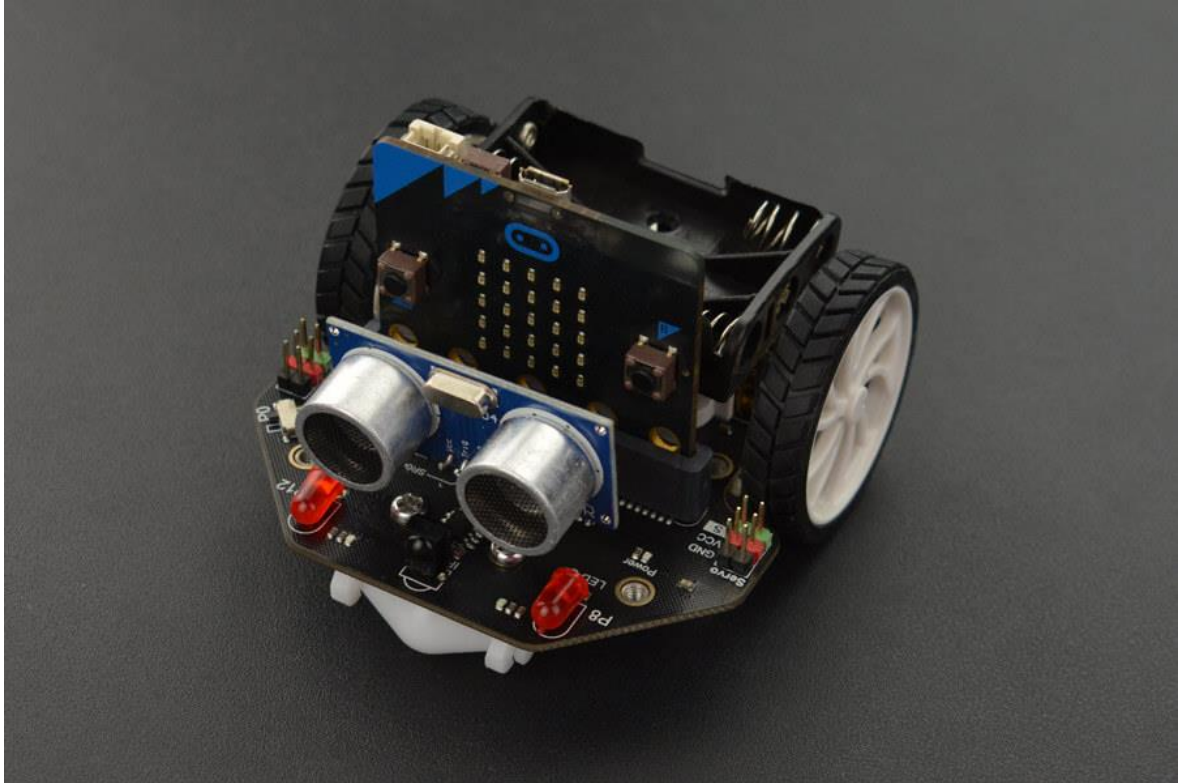


# Bluguard Maqueen Lite



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## Chapter 1: Introduction to Bluguard Maqueen Lite

Bluguard Maqueen is a micro:bit plug-and-play module allows children to learn graphic programming in a most entertaining and fun way. It is nurturing children's logical thinking and programming skills.

Bluguard Maqueen is accessible to both Mind+ and Makecode programming platform now. Mind+ is a graphical programming platform supporting python, Arduino and other platforms. On the other hand, MakeCode programming platform allowing users to execute functions by dragging and snapping the graphical blocks.



The advertisement features a cartoon robot head with large eyes and a friendly expression. Below it, five colorful micro:bit boards are shown, each displaying a different educational program. To the right, text encourages users to 'Stand on the shoulders of giants, enjoy online educational sources together with 4 million children'. A lightbulb icon is positioned above a text box that describes the micro:bit as a tiny programmable computer. To the right of this text is a close-up image of the micro:bit board, showing its pins and components.

**Weapon Maqueen with micro:bit as brain!**

Stand on the shoulders of giants, enjoy online educational sources together with 4 million children

micro: bit is a tiny programmable computer which is portable and only palm-sized. It is designed for primary and secondary school students to learn digitalized and computer thinking. micro:bit makes teaching and learning simple and fun.

[Learn more](#)

Suggest Age: 8 +

Adult supervision is recommended for children under 8 years old.



## Easy to Build in **60s**

### 4-step assembly, Fool Proof

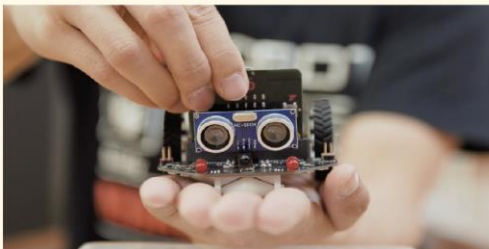
Save efforts for entire-class teaching and leave more time to create and play



1. Install wheels



2. Fix battery holder



3. Plug in micro: bit (order separately)

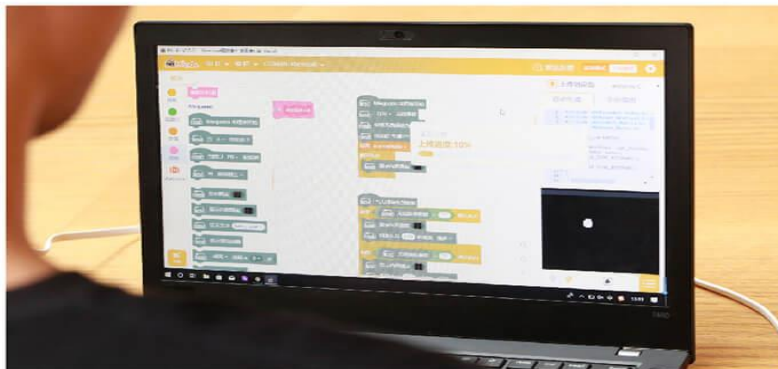


4. Install ultrasonic sensor



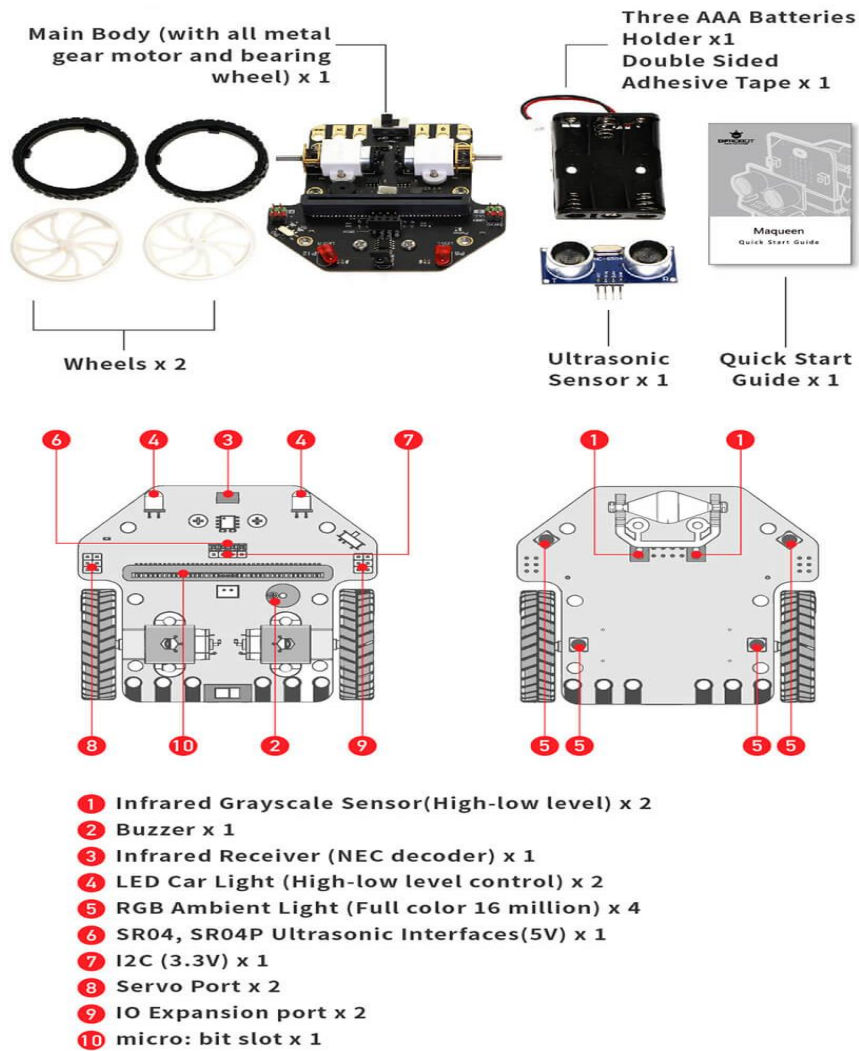
## Start Graphical Programming in **1** Hour

**1** Graphical Programming, play coding in blocks while learn programming and logical thinking.



**2** Support multiple platforms: Mind+, Makecode, Scratch, Python; grow from zero to hero.





## Features:

- Support for Makecode and Mind+ programming platform
- Small size, flexible movement
- All-metal miniature gear motor
- Line patrol, ambient light, LED lights, ultrasonic interface, buzzer, I2C interface, mechanical expansion screw hole, etc
- Exclusive customized POM bearing wheel, strong obstacle crossing ability
- Easy to install, easy to use

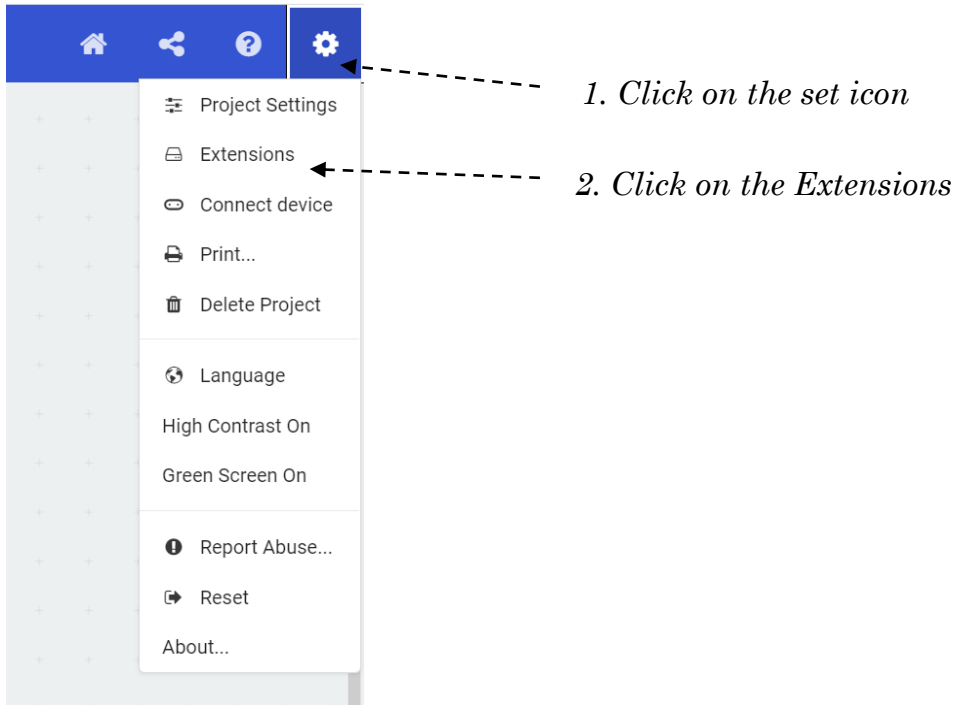
**Specification:**

- Supply Voltage: 3.5V~5V DC (Three AAA batteries or 3.6V~3.7V lithium battery)
- Infrared Grayscale Sensor (High-low level) x 2
- Buzzer x 1
- Infrared Receiver (NEC decoder) x 1
- LED Lights (High-low level control) x 2
- RGB Ambient Light (16 million colours) x 4
- SR04, SR04P Ultrasonic Interface(5V) x 1
- IIC Interface (3.3V) x 1
- Gravity Extension Interfaces (P1, P2) x 2
- N20 All-metal Gear Motor x 2
- Motor Reduction Ratio: 1:150
- Maximum Rotate Speed: 133 rpm
- Motor Drive Mode: PWM motor drive
- Bracket and Protective Cover Extension M3 Screw Hole x 6
- Programming Method: Makecode graphical programming, Mind+ graphical programming (based on Scratch 3.0)
- Dimension: 81mm x 85 mm x 44mm/3.19 x 3.35 x 1.73in
- Weight: 75.55g

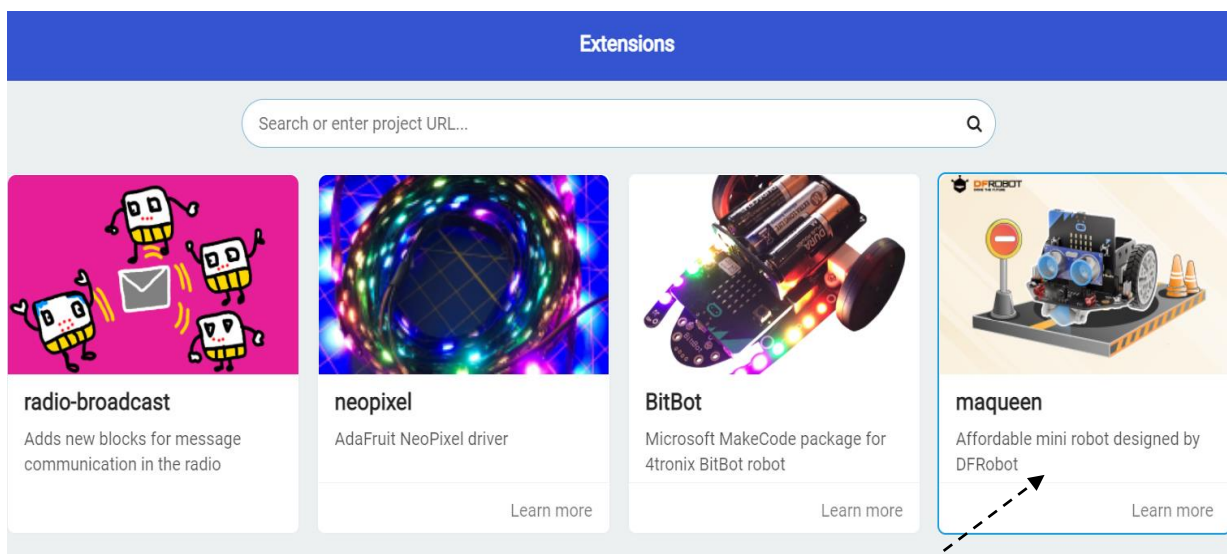
**Note:** micro:bit and the AAA battery are not included

## Chapter 2: Import the MakeCode Graphical Library

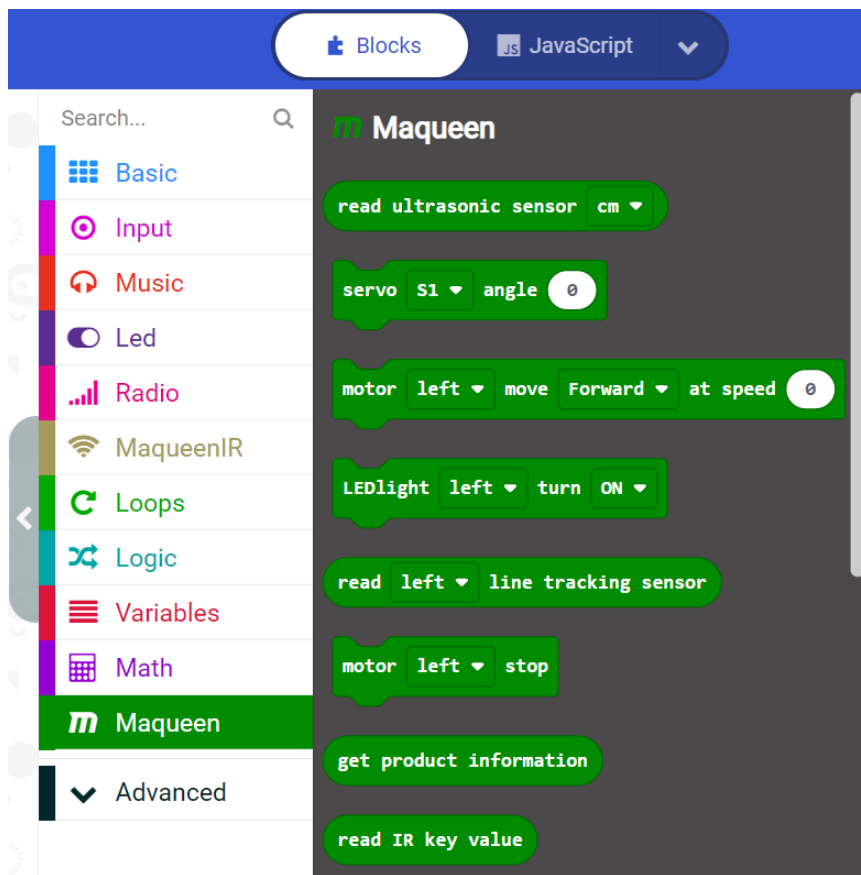
1. Click the link <https://makecode.microbit.org>, enter the makecode graphical online programming platform and create **New Project**. (Note: Loading will be slow the first time, please wait patiently)
2. Import the extensions.



3. Click on the Maqueen's library.



4. Import completed.



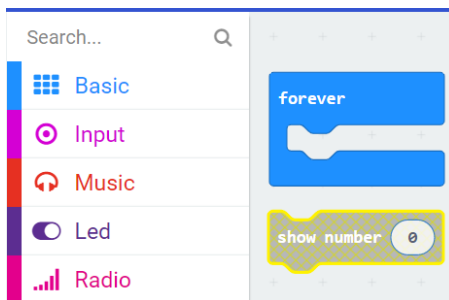


## Chapter 3: Read Ultrasonic Distance

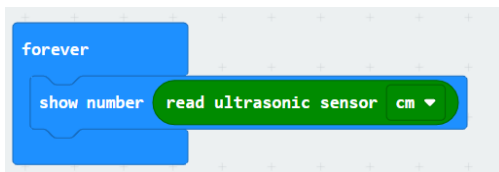
In this chapter, users will learn how to use ultrasonic to read the distance of ultrasound. The ultrasonic detects the obstruction in front and the distance will be displayed on the dot-matrix screen in centimeters.

### Step of Makecode Graphical Program:

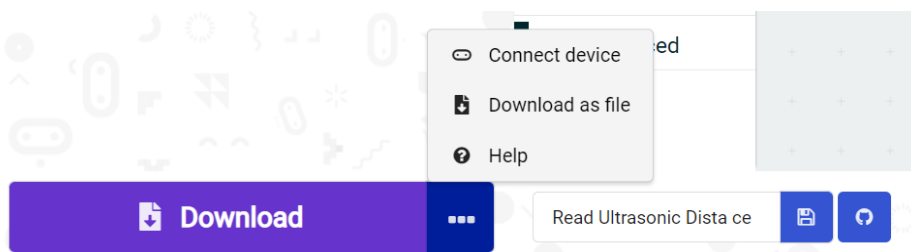
1. Add the block 'forever' (Basic) & 'show number [0]' (Basic). Drag the block 'show number [0]' (Basic) into block 'forever' (Basic).



2. Add the block 'read ultrasonic sensor cm' (Maqueen) and replace it at '[0]'.



3. Go to 'connect device' after connecting micro:bit with cable. Just follow instructions and this step is just one-time setup.



4. Click **Download** to transfer your code to micro:bit.
5. Move your hand towards the ultrasonic and the micro:bit will show you the distance in cm.

### Program Link :

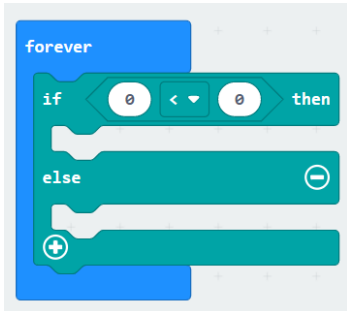
[https://makecode.microbit.org/\\_ghjJuL5gW2kL](https://makecode.microbit.org/_ghjJuL5gW2kL)

## Chapter 4: Light Operated Sprite

The car does not move in the darker light, and as the flashlight illuminates the LED, the vehicle's forward speed begins to increase as the intensity of the light increases.

### Step of Makecode Graphical Program:

1. Add the block 'forever' (Basic), 'if...then...else' (Logic) and '[0] < [0]' (Logic).



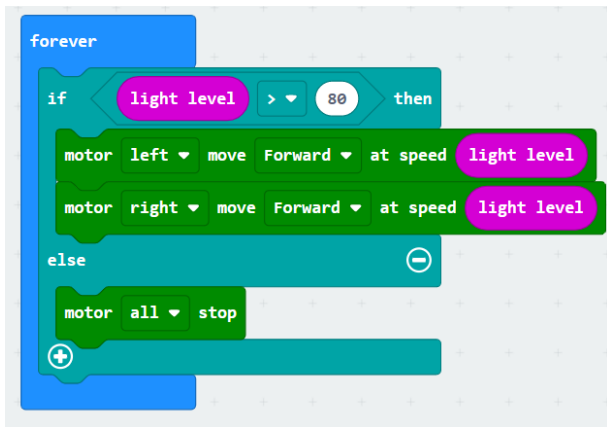
2. For condition 'if', replace left '[0]' with '[light level]' (Input). Change the symbol '<]' to '>]' and value another '[0]' to '[80]'.



3. For condition 'then', add the block 'motor [left] move [Forward] at speed [0]' (Maqueen) and replace '[0]' with '[light level]' (Input). Duplicate 'motor [left] move [Forward] at speed [light level]' (Right-click->Duplicate) and change '[left]' to '[right]'.



4. For condition 'else', slot in the block 'motor [all] stop' (Maqueen).



5. Click **Download** to transfer your code to micro:bit.
6. Flash the light towards micro:bit and Maqueen will move forward else will stop.

**Program Link :**

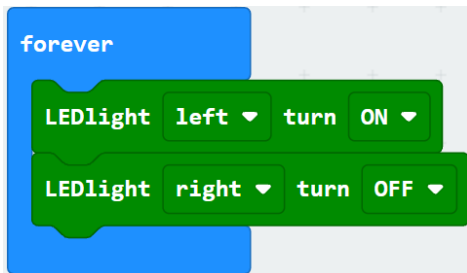
<https://makecode.microbit.org/XieA1wc05XHu>

## Chapter 5: Flash LED Lights

This chapter will teach you how to control the left and right LEDs flash alternately at an interval of 500 milliseconds. Meanwhile, the buzzer makes two different tones with the flashing frequently.

### Step of Makecode Graphical Program:

1. Add the block 'forever' (Basic). Add the block 'LEDlight [left] turn [ON]' (Maqueen) and duplicate it. After duplicate change the '[left]' to '[right]' and '[ON]' to '[OFF]'.



2. Add the block 'play tone [Middle C] for [1 beat]' (Music). Add the block 'pause (ms) [100]' (Basic) and change value '[100]' to '[500]'.



- Duplicate 2 units block 'LEDlight [ ] turn [ ]'. Change it to 'LEDlight [left] turn [OFF]', 'LEDlight [right] turn [ON]'. Add the block 'play tone [Middle E] for [1 beat]' (Music) and 'pause (ms) [500]' (Basic).



- Click **Download** to transfer your code to micro:bit.

**Program Link :**

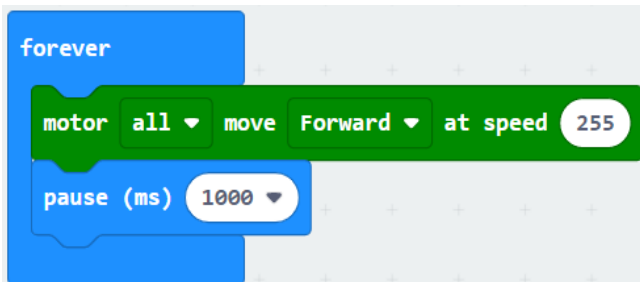
<https://makecode.microbit.org/Pyk5piJq5fCH>

## Chapter 6: Motor Controlling

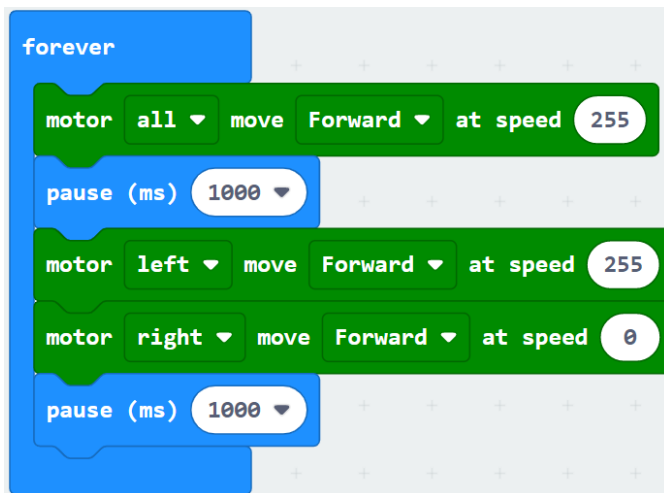
In this chapter, you will learn how to control the Maqueen moves forward 1 second, turn right 1 second, turn left 1 second, move backwards 1 second and turn right 1 second.

### Step of Makecode Graphical Program:

1. Add the block 'forever' (Basic). Next is to add the block 'motor [all] move [Forward] at speed [255]' (Maqueen) and block 'pause (ms) [1000]' (Basic).



2. Duplicate 2 units block 'motor [ ] move [ ] at speed [ ]'. Change it to 'motor [left] move [Forward] at speed [255]' and 'motor [right] move [Forward] at speed [0]'. Next is duplicate block 'pause (ms) [1000]'.



- Duplicate 2 units block 'motor [ ] move [ ] at speed [ ]'. Change it to 'motor [left] move [Forward] at speed [0]' and 'motor [right] move [Forward] at speed [255]'. Next is duplicate block 'pause (ms) [1000]'.

```
forever
  motor all move Forward at speed 255
  pause (ms) 1000
  motor left move Forward at speed 255
  motor right move Forward at speed 0
  pause (ms) 1000
  motor left move Forward at speed 0
  motor right move Forward at speed 255
  pause (ms) 1000
```

- Add the block 'motor [all] move [Backward] at speed [255]' (Maqueen) and block 'pause (ms) [1000]' (Basic).

```
forever
  motor all move Forward at speed 255
  pause (ms) 1000
  motor left move Forward at speed 255
  motor right move Forward at speed 0
  pause (ms) 1000
  motor left move Forward at speed 0
  motor right move Forward at speed 255
  pause (ms) 1000
  motor all move Backward at speed 255
  pause (ms) 1000
```

- Duplicate 2 units block 'motor [ ] move [ ] at speed [ ]'. Change it to 'motor [left] move [Backward] at speed [255]' and 'motor [right] move [Backward] at speed [0]'. Next is duplicate block 'pause (ms) [1000]'.

The image shows a Scratch code editor with a 'forever' loop containing the following blocks:

- motor all move Forward at speed 255
- pause (ms) 1000
- motor left move Forward at speed 255
- motor right move Forward at speed 0
- pause (ms) 1000
- motor left move Forward at speed 0
- motor right move Forward at speed 255
- pause (ms) 1000
- motor all move Backward at speed 255
- pause (ms) 1000
- motor left move Backward at speed 255
- motor right move Backward at speed 0
- pause (ms) 1000

- Click **Download** to transfer your code to micro:bit.

**Program Link :**

[https://makecode.microbit.org/\\_0w6TE93wTW5d](https://makecode.microbit.org/_0w6TE93wTW5d)

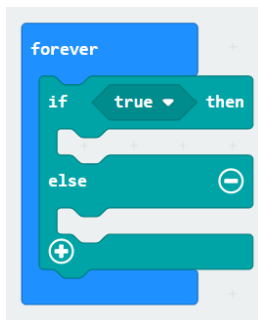


## Chapter 7: Ultrasonic Obstacle Avoidance

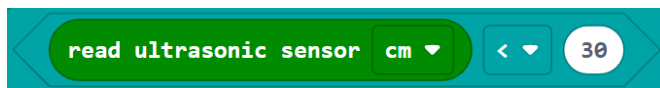
This demo will show you how to use the ultrasonic sensor to constantly detect the distance between the Maqueen and the obstacle ahead, if it is smaller than 30cm, Maqueen randomly turns left or right to avoid the obstacle.

### Step of Makecode Graphical Program:

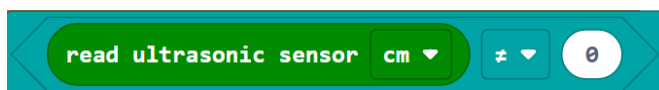
1. Add the block 'forever' (Basic) and block 'if...then...else' (Logic).



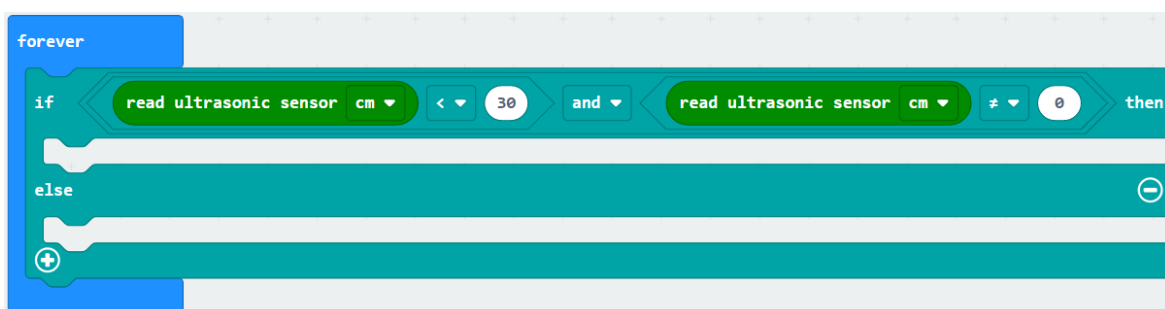
2. Add the block '[0] < [0]' (Logic) and 'read ultrasonic sensor [cm]' (Maqueen). Replace the value '[0]' with 'read ultrasonic sensor [cm]' and change another '[0]' to '[30]'.



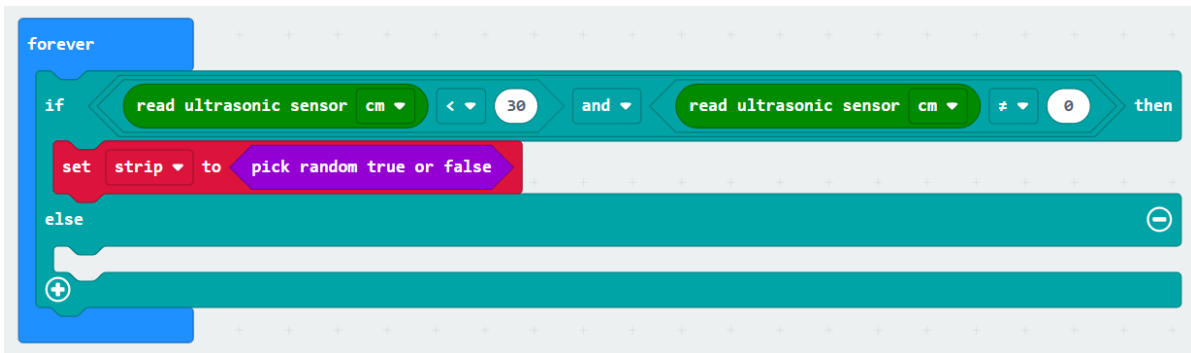
3. Duplicate the step 2 block and change the symbol '[<]' with '[≠]' and value '[30]' to '[0]'.



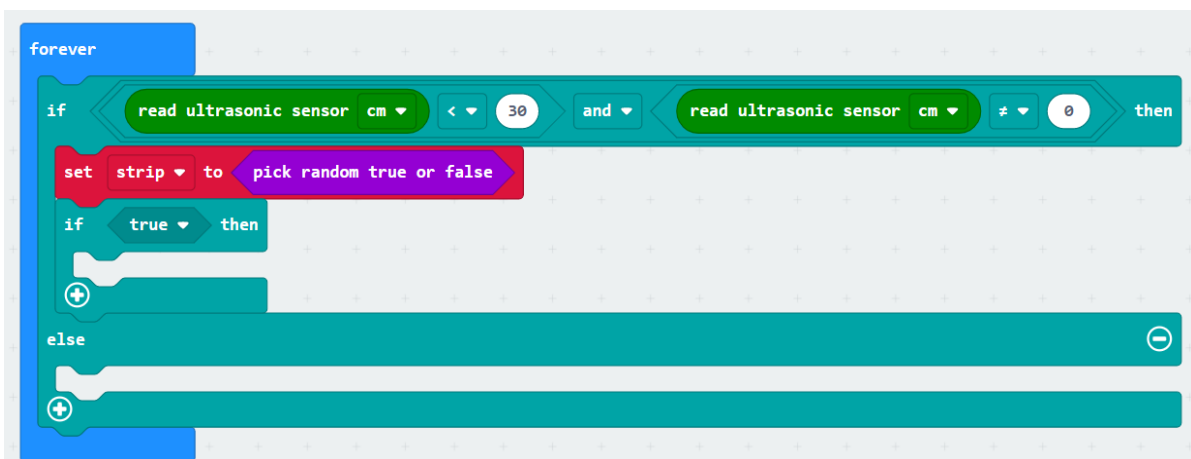
4. For condition 'if', add the block '[ ] and [ ]' (Logic). Slot in '[block step 2]' and '[block step 3]'.



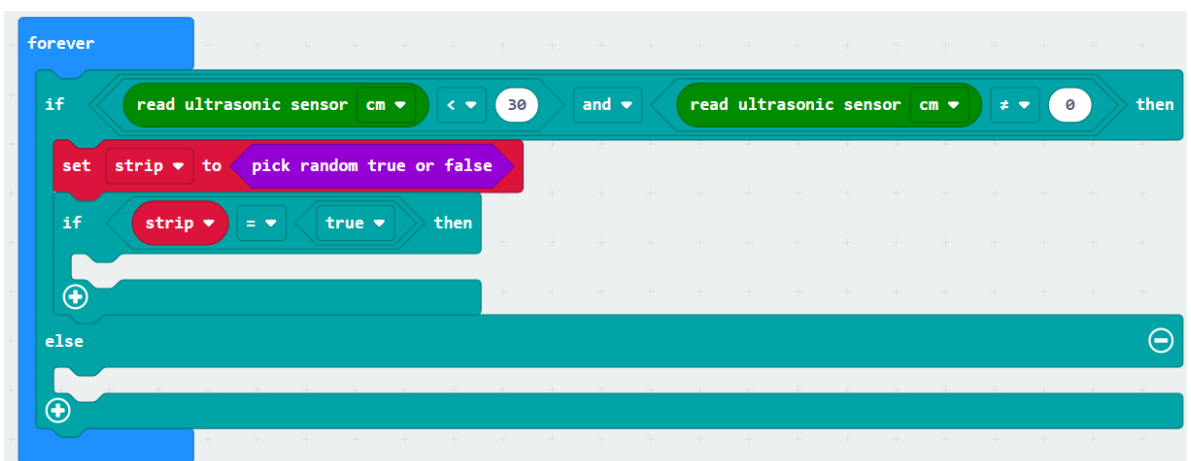
5. Go to (Variables) and make a variable 'strip'. For condition 'then', add the block 'set [strip] to [0]' (Variables). Replace the '[0]' with 'pick random true or false' (Math).



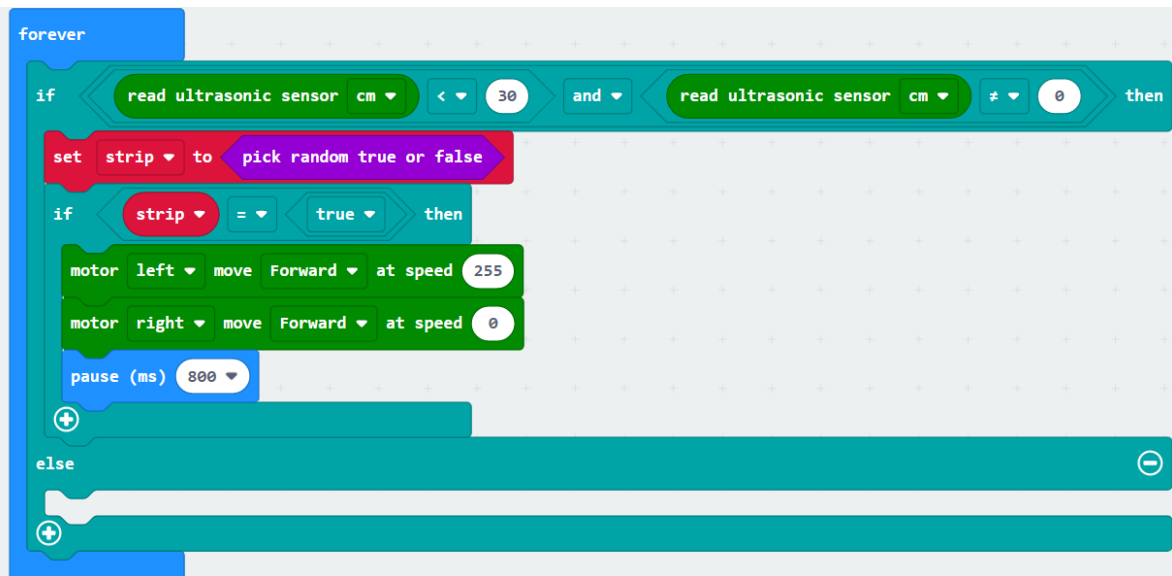
6. Add the block 'if...then' (Logic).



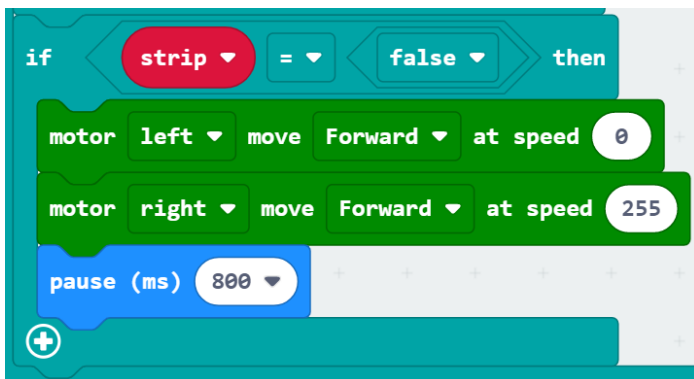
7. For condition 'if', add the block '[0] = [0]' (Logic). Replace value '[0]' with '[strip]' (Variables) and another '[0]' with '[true]' (Logic).



- For condition 'then', add the block 'motor [left] move [Forward] at speed [255]' (Maqueen), 'motor [right] move [Forward] at speed [0]' (Maqueen) and block 'pause (ms) [800]' (Basic).



- Duplicate the block of 2<sup>nd</sup> conditional block 'if'. Change the value '[true]' to '[false]', '[255]' to '[0]', '[0]' to '[255]'.



10. Slot in block step 9 as a new condition. For condition 'else' is add the block 'motor [all] move [Forward] at speed [255]' (Maqueen).

```
forever
  if (read ultrasonic sensor cm < 30 and read ultrasonic sensor cm != 0) then
    set strip to pick random true or false
    if (strip = true) then
      motor left move Forward at speed 255
      motor right move Forward at speed 0
      pause (ms) 800
    if (strip = false) then
      motor left move Forward at speed 0
      motor right move Forward at speed 255
      pause (ms) 800
    else
      motor all move Forward at speed 255
```

11. Click **Download** to transfer your code to micro:bit.

**Program Link :**

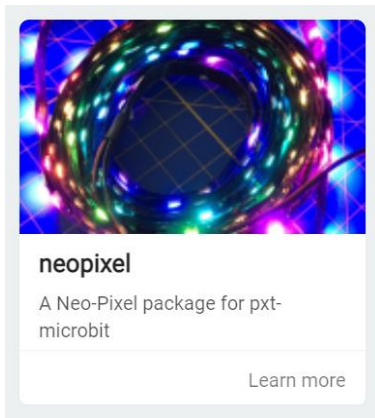
<https://makecode.microbit.org/7Ay2qVeUUPi0>

## Chapter 8: RGB Colourful Breathing LEDs

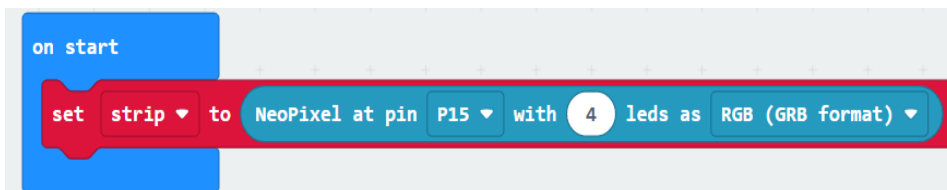
In this chapter, you will learn how to let the RGB ambient lights at the bottom of the Maqueen show a variety of colours to present a breathing effect.

### Step of Makecode Graphical Program:

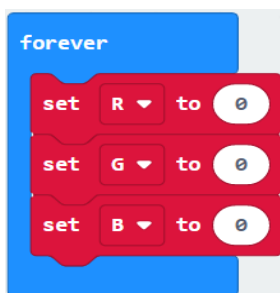
1. Load the LED strip library from Extensions → Neopixel.



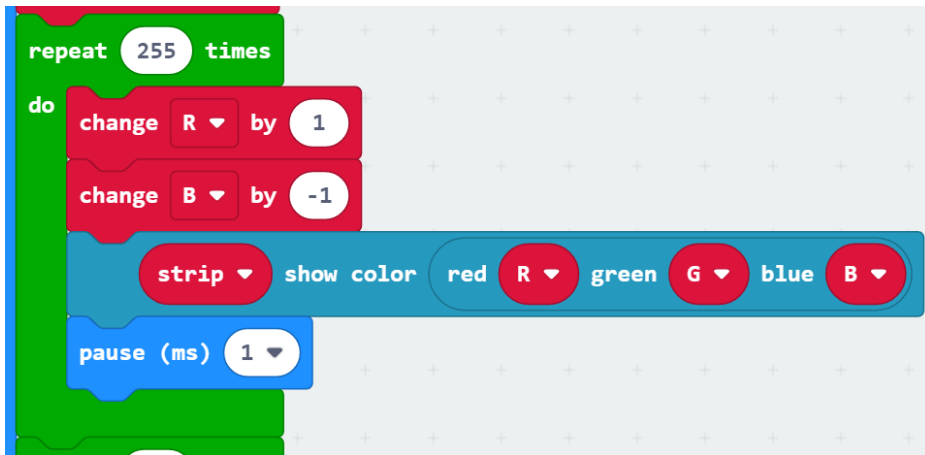
2. Add the block 'on start' (Basic). Slot in 'set [strip] to [NeoPixel at pin [P0] with [24] leds as [RGB (GRB format)]' (Neopixel). Change the value '[P0]' to '[P15]' and '[24]' to '[4]'.



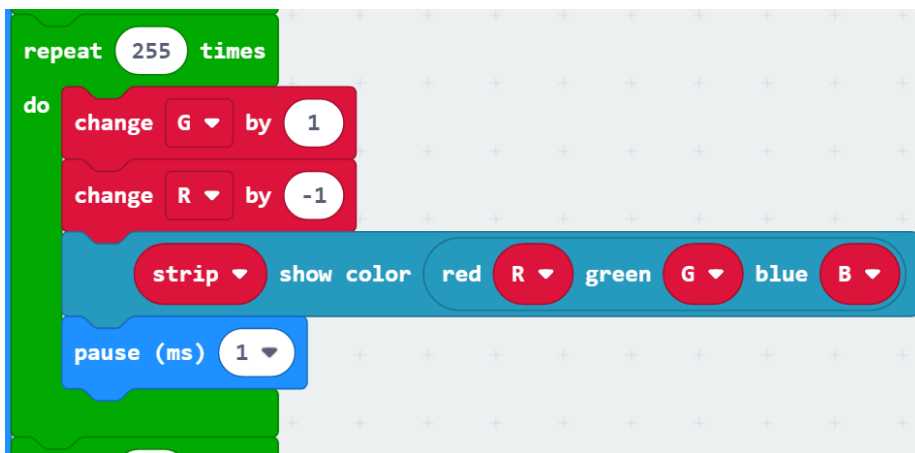
3. Add the block 'forever' (Basic). Go to (Variables) and make a variable 'R', 'G' and 'B'. Add the block 'set [R] to [0]', 'set [G] to [0]' and 'set [B] to [0]' (Variables).



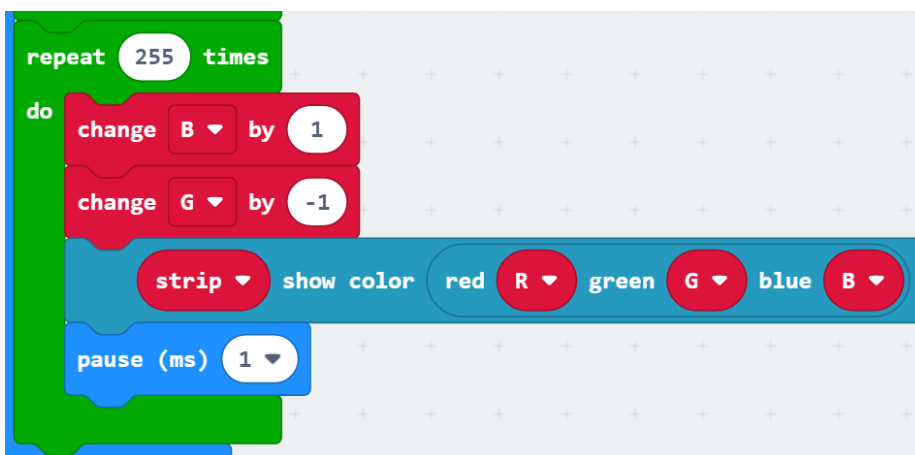
4. Add the block 'repeat [255] times...do' (Loop). Add the block 'change [R] by [1]' and 'change [B] by [-1]' (Variables). Next, add the block '[strip] show color [red]' (Neopixel) and replace '[red]' to '[red[R]green[G]blue[B]]' (Neopixel...more). At last add the block 'pause(ms)[1]' (Basic).



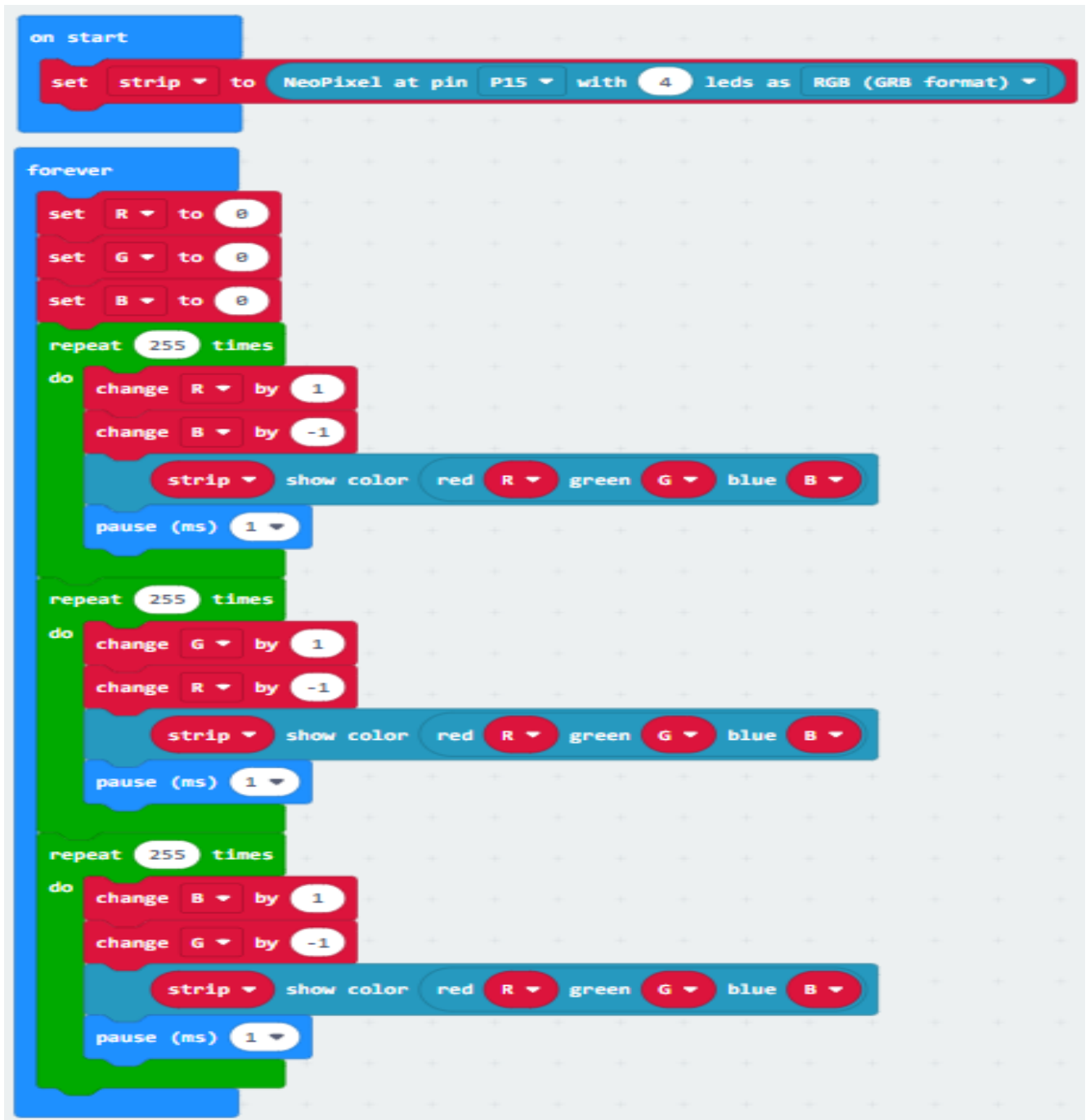
5. Duplicate block step 4. Change the value '[R]' to '[G]' and '[B]' to '[R]'.



6. Duplicate block step 5. Change the value '[G]' to '[B]' and '[R]' to '[G]'.



7. Finally add steps 4, 5 and 6 in block 'forever' (Basic).



8. Click **Download** to transfer your code to micro:bit.

**Program Link :**

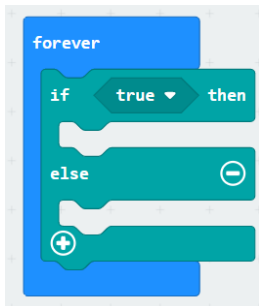
<https://makecode.microbit.org/4DWCPH6ezaRs>

## Chapter 9: Line Tracking

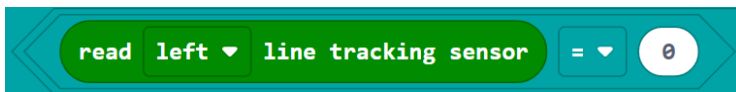
This chapter will let the Maqueen drive along the black line on the track map. If you don't have a track map, you can make one using black adhesive tape.

### Step of Makecode Graphical Program:

1. Add the block 'forever' (Basic) and block 'if...then...else' (Logic).



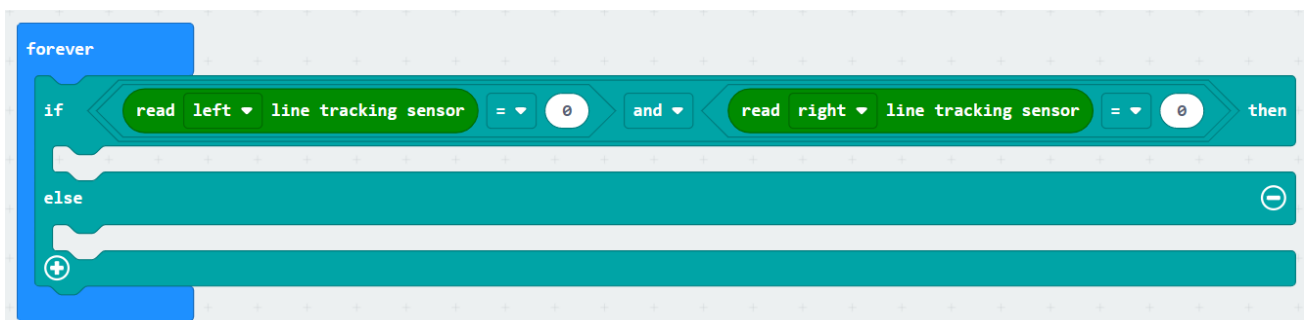
2. Add the block '[0] = [0]' (Logic) and replace left '[0]' with 'read [left] line tracking sensor' (Maqueen).



3. Duplicate block step 2 and change '[left]' to '[right]'.

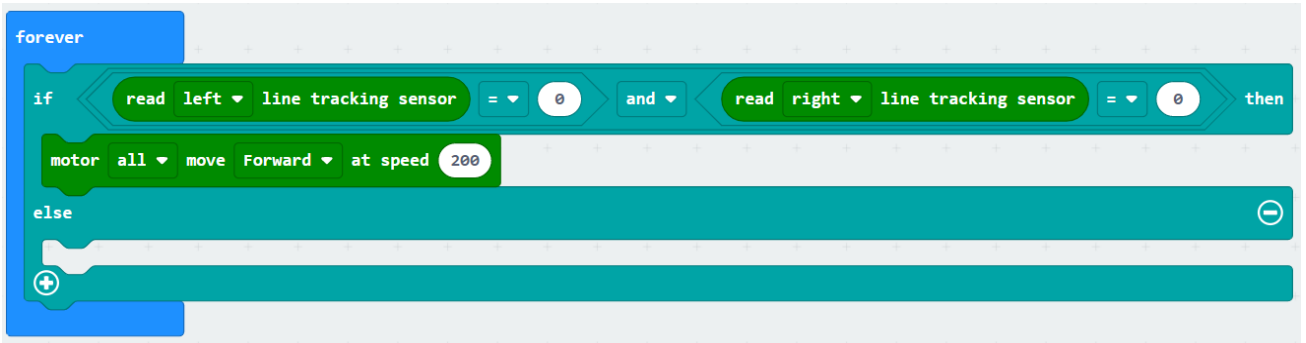


4. For condition 'if', add the block '[ ] and [ ]' (Logic). Slot in '[block step 2]' and '[block step 3]'.

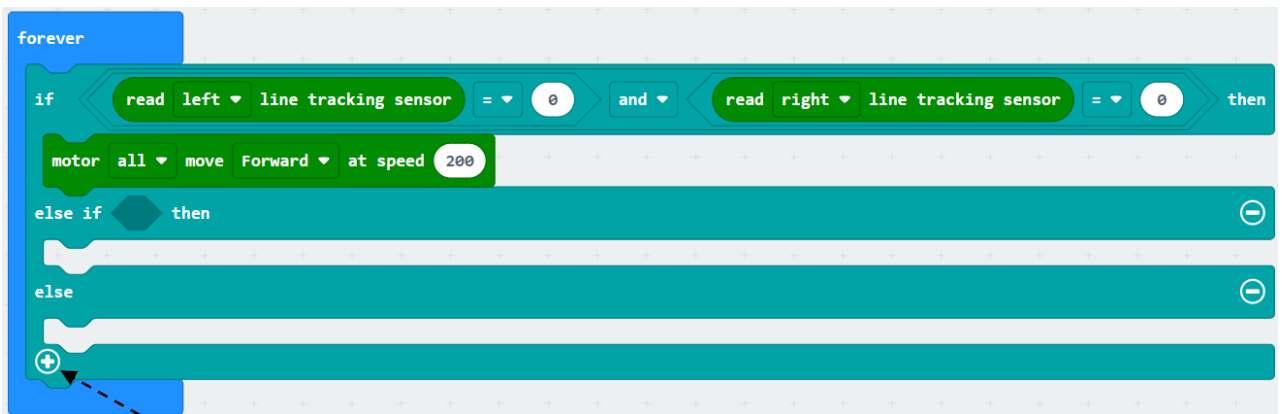




- For condition 'then', add the block 'motor [all] move [Forward] at speed [200]' (Maqueen).

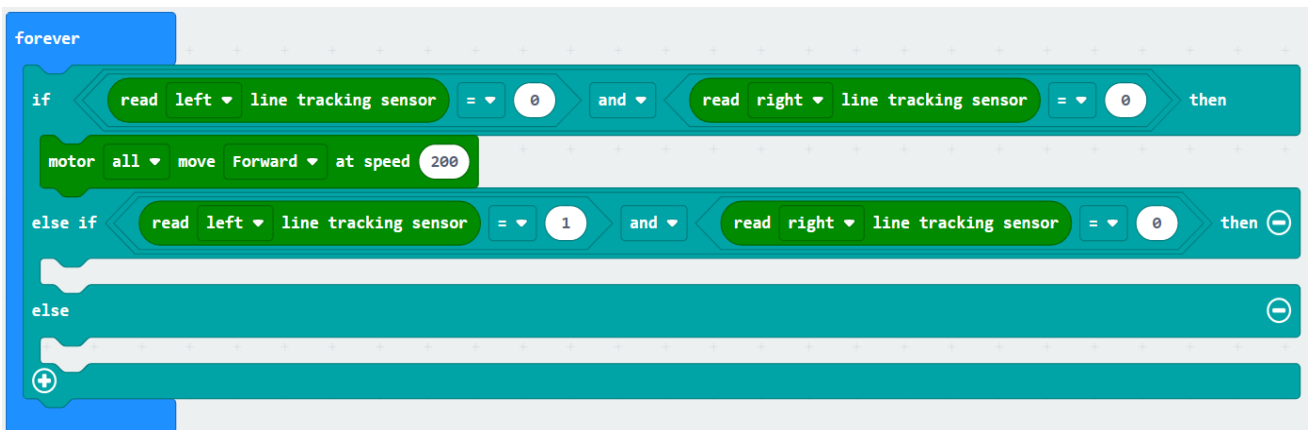


- To create condition 'else if...then', click on the symbol '+'. A dashed arrow points from this step to the '+' button in the next image.

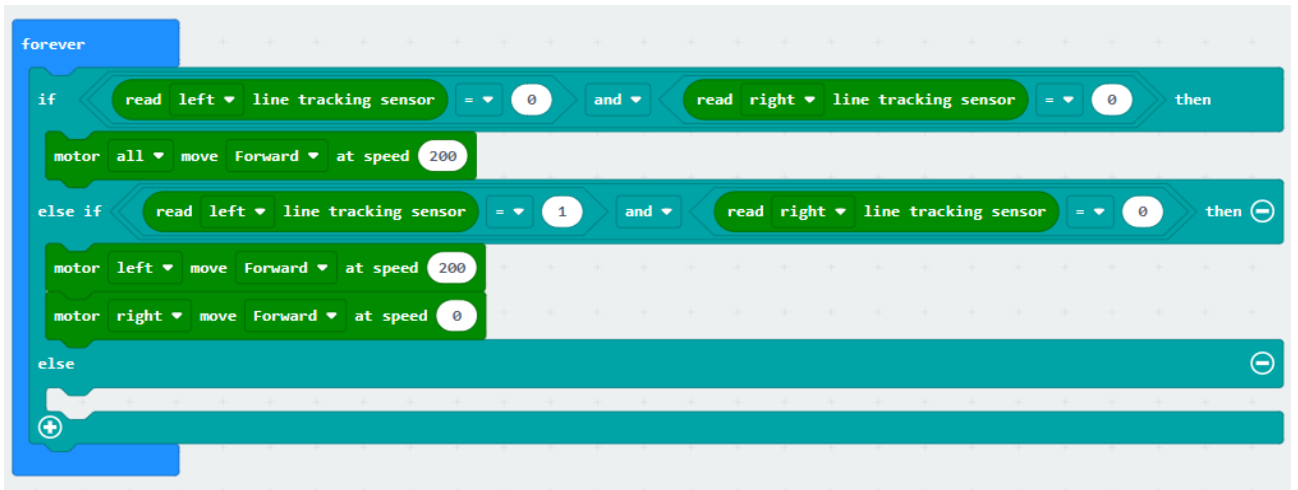


*Just click on it.*

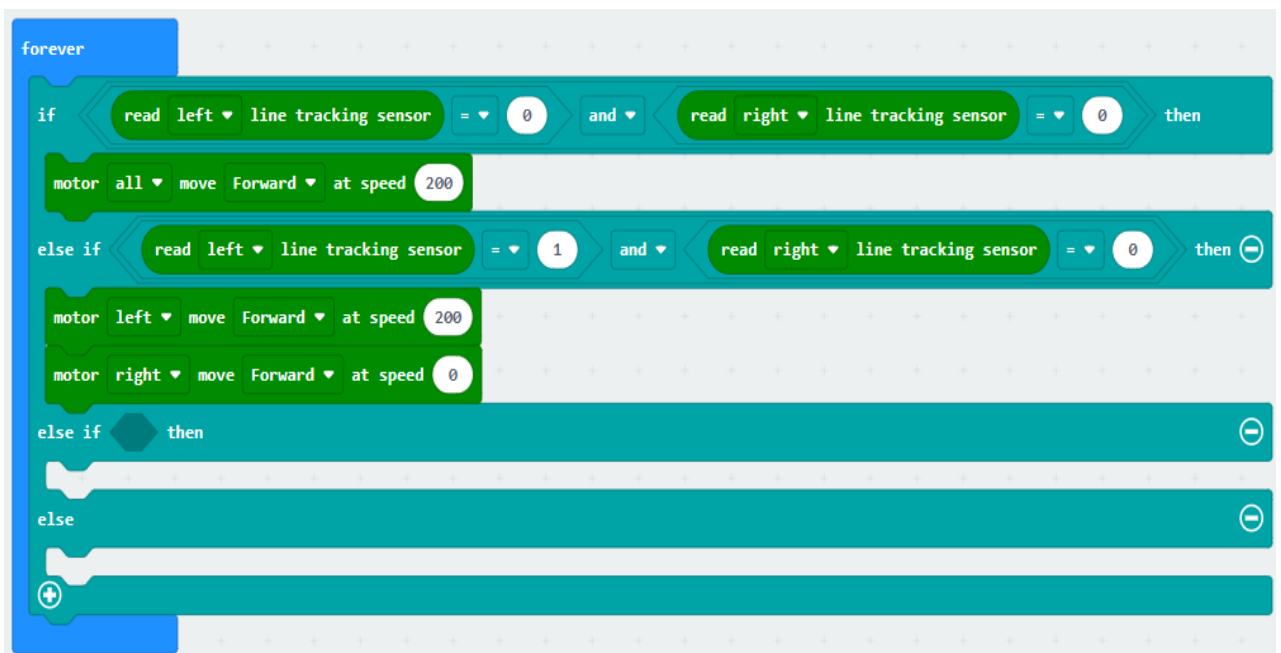
- Duplicate the block of 1<sup>st</sup> condition 'if' '[-] and [-]'. Slot in condition 'else if' and change the value '[0]' to '[1]' for '[read [left] line tracking sensor]'.



8. Add the block 'motor [left] move [Forward] at speed [200]' and 'motor [right] move [Forward] at speed [0]' (Maqueen).



9. Create 2<sup>nd</sup> condition 'else if...then', click on the symbol '+'.



- Duplicate the block of condition 'else if' '[---] and [---]'. Slot in condition 'else if' and change the value '[0]' to '[1]'. Add the block 'motor [left] move [Forward] at speed [200]' and 'motor [right] move [Forward] at speed [0]' (Maqueen).



- Create 3<sup>rd</sup> condition 'else if...then', click on the symbol '+'. Duplicate the block of 2<sup>nd</sup> condition 'else if' '[---] and [---]'. Slot in condition 'else if' and change the value '[1]' to '[0]' for '[read [left] line tracking sensor]'.



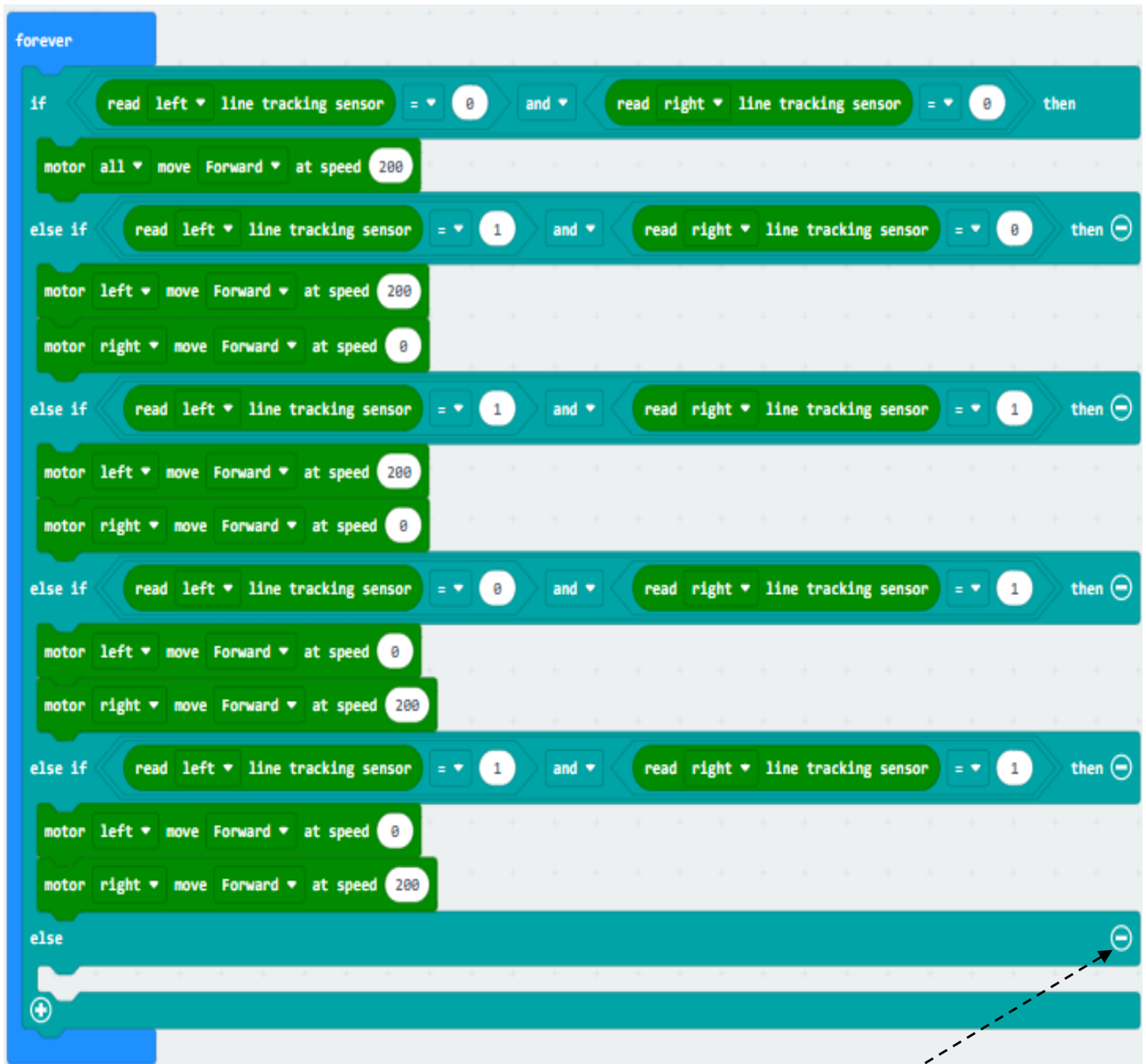
12. Add the block 'motor [left] move [Forward] at speed [0]' and 'motor [right] move [Forward] at speed [200]' (Maqueen).



13. Create 4<sup>th</sup> condition 'else if...then', click on symbol '+'. Duplicate the block of 3<sup>rd</sup> condition 'else if' '[---] and [---]'. Slot in condition 'else if' and change the value '[0]' to '[1]' for '[read [left] line tracking sensor]'.



14. Add the block 'motor [left] move [Forward] at speed [0]' and 'motor [right] move [Forward] at speed [200]' (Maqueen). To remove the condition 'else', click on the symbol '—'.



*Just click on it.*

15. Click **Download** to transfer your code to micro:bit.

**Program Link:**

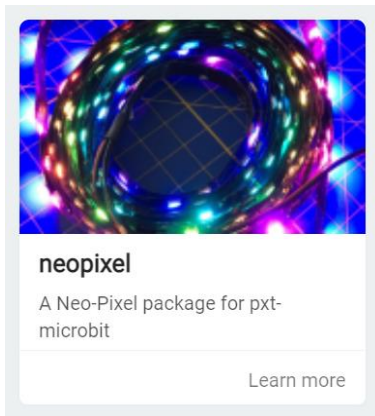
[https://makecode.microbit.org/\\_JmPDo9ArsX7o](https://makecode.microbit.org/_JmPDo9ArsX7o)

## Chapter 10: Let's Party

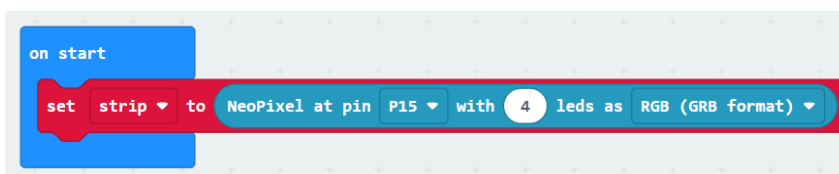
In the last chapter, you will learn to Press Button A to light up RGBs, Press Button B to move Maqueen and Press Button A and B to make Maqueen play sound.

### Step of Makecode Graphical Program:

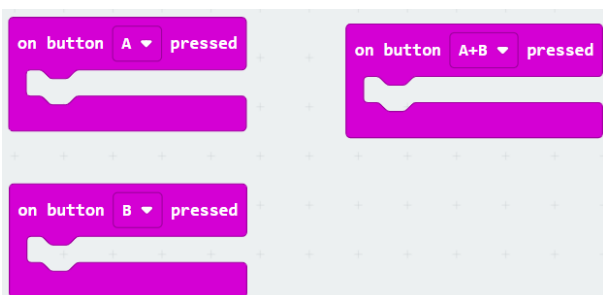
1. Load the LED strip library from Extensions → Neopixel.



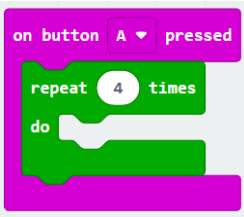
2. Add the block 'on start' (Basic). Slot in 'set [strip] to [NeoPixel at pin [P0] with [24] leds as [RGB (GRB format)]' (Neopixel). Change the value '[P0]' to '[P15]' and '[24]' to '[4]'.



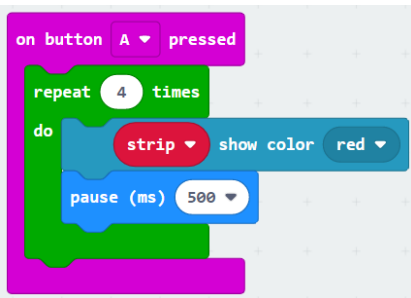
3. Add the block 'on button [A] pressed' (Input). Duplicate 2 units block and change to '[B]' and '[A+B]'.



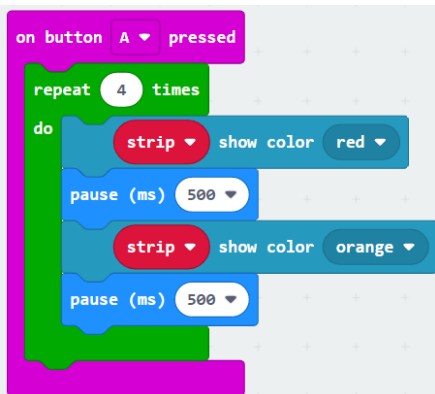
- Slot in the block 'repeat [4] times...do' (Loop) in the block 'on button [A] pressed' (Input).



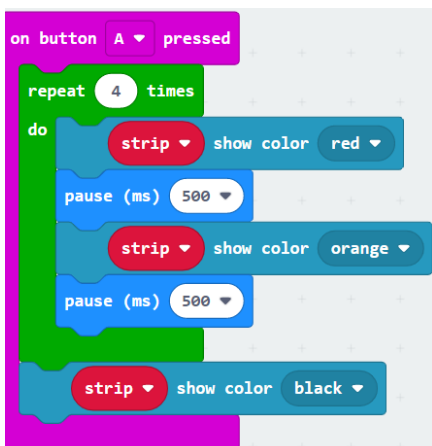
- Add the block '[strip] show color [red]' (Neopixel) and add the block 'pause(ms)[500]' (Basic).



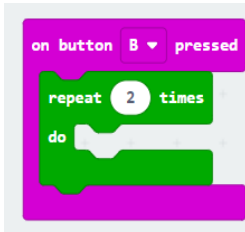
- Add the block '[strip] show color [orange]' (Neopixel) and add the block 'pause(ms)[500]' (Basic).



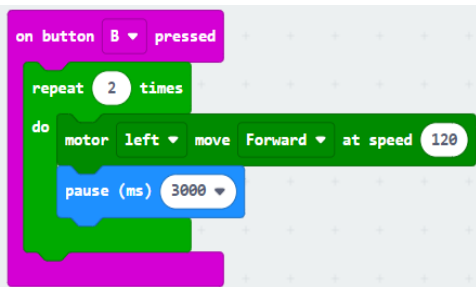
- Add the block '[strip] show color [black]' (Neopixel).



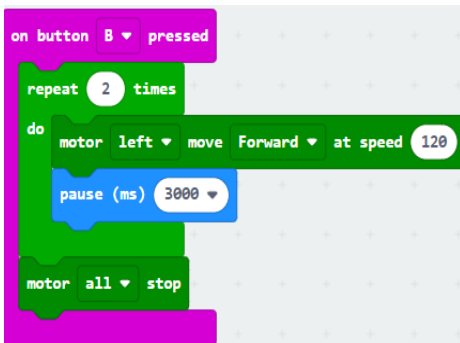
8. Add the block 'repeat [2] times...do' (Loop) in the block 'on button [B] pressed' (Input).



9. Add the block 'motor [left] move [Forward] at speed [120]' (Maqueen) and the block 'pause(ms)[3000]' (Basic).



10. Add the block 'motor [all] stop' (Maqueen).

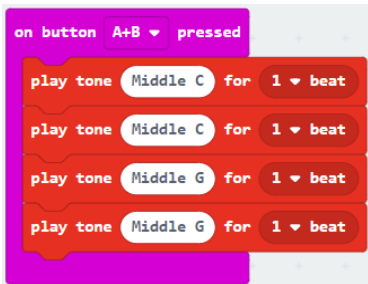


11. Add the block 'play tone [Middle C] for [1 beat]' (Music) and duplicate it in the block 'on button [A+B] pressed' (Input).

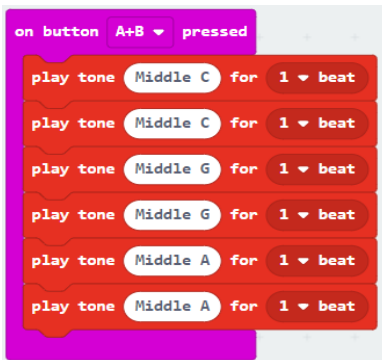




12. Add the block 'play tone [Middle G] for [1 beat]' (Music) and duplicate it.



13. Add the block 'play tone [Middle A] for [1 beat]' (Music) and duplicate it.



14. Add the block 'play tone [Middle G] for [2 beats]' (Music).



15. Click **Download** to transfer your code to micro:bit.

**Program Link :**

[https://makecode.microbit.org/ 5bcD5CYC2aTe](https://makecode.microbit.org/5bcD5CYC2aTe)